Ohio Environmental Protection Agency

Division of Surface Water

Application for Authorization
Class B Biosolids Beneficial Use Sites

MOQ-03-01 to 04

Division of Surface Water
Application for Authorization
Class B Beneficial Use Sites

Form BUA-1

Biosolids Treatment Works Information

Treatment works name: Ringler Energy, LLC		
Ohio NPDES permit #: 4IN00204*AD		County: Morrow
Mailing address: 5575 Granger Rd. Suite 320		
City: Independence	State: OH	Zip: 44131
Operator of record: Bruce Bailey, Vice President of Technical Affairs		
Telephone number: 216-986-9999		
Email address (if available): bbailey@quasareg.com		

Certification Statement

1. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

2. I have read and understand Chapter 3745-40 of the Ohio Administrative Code (OAC) and I agree to beneficially use biosolids in accordance with all applicable beneficial use requirements and restrictions established in Chapter 3745-40 of the Ohio Administrative Code.

3. I agree to only beneficially use biosolids that have satisfied a pathogen reduction alternative and a vector attraction reduction option and have metals concentration below the pollutant ceiling concentrations as established in Chapter 3745-40 of the Ohio Administrative Code.

4. I agree to maintain all applicable records established in Chapter 3745-40 of the Ohio Administrative Code.

Signature

3 / 7 / 14
Date

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Form BUA-2

Owner Consent for Beneficial Use

Exemption 6

Certification Statement

1. I agree to allow biosolids generated by the treatment plant identified on Form BUA-1 to be beneficially used on my property at agronomic rates.

2. I agree to allow federal, state and local regulatory staff access to the beneficial use site for the purposes of inspecting and authorizing the beneficial use site, beneficially using biosolids, and collecting and analyzing samples from the beneficial use site. I reserve the right to ask the above parties for proper identification at any time.

3. I certify that I am holder of legal title to the property described on application form BUA-4, or am authorized by the holder to give consent for the land application of biosolids, and that there are no restrictions to the granting of consent under this form.

Exemption 6 3 / 19 / 12
Date

In the event the owner of the beneficial use site changes, Form BUA-2 must be revised and resubmitted to Ohio EPA.

energy group
7624 Riverview Road
Cleveland, OH 44141
(216) 986-9999
www. energygroup.com

quasar energy group

Form BUA-3

Beneficial Use Site Operator Consent for Beneficial Use

Exemption 6

Certification Statement

I agree to be responsible for complying with all applicable beneficial use requirements established in Chapter 3745-40 of the Ohio Administrative Code.

Exemption 6

3 / 19 / 12
Date

In the event the operator of the beneficial use site changes, Form BUA-3 must be revised and resubmitted to Ohio EPA.

Beneficial User Information

Beneficial user:		
Contact person:		
Mailing address:		
City:	State:	Zip:
Telephone number:		

energy group
7674 Riverview Road
Cleveland, OH 44141

(216) 986-9999
www.[redacted]energygroup.com

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ED_014244A_00000159-00006

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Form BUA-4 Page 1 of 2

Beneficial Use Site Information

Ohio EPA Site I.D. (Ohio EPA Use Only)

Field site I.D.:**MOQ-03-01**	
Beneficial use site location: **East of St. Rt. 42 South of Westfield Fulton Rd.**	
County: **Morrow**	Township: **Westfield**
Latitude: **40°26'5.52"N**	Longitude: **82°56'43.63"W**

Total acreage proposed for beneficial use: **211.5 acres**	
Soil pH (s.u.): **6.1**	Soil phosphorus (mg/kg): **52.0** Bray Kurtz P1 ■ Mehlich 3 ☐
Bedrock depth (feet): **>3'**	

Type of crops to be grown:

Crop Type	Expected Yield
Corn	**185 bu**
Soybeans	**60 bu**
Wheat	
Pasture	
Hay	
Other:	

Soil Types:

Soil Unit Symbol	Soil Unit Name	Hydrologic Soil Group
Blg1A1	**Blount silt loam, ground morain, 0 to 2 % slopes**	**D**
Blg1B1	**Blount Silt loam, ground morain, 2 to 4 % slopes**	**D**
Gwd1B1	**Glynwood silt loam, 2 to 6 % slopes,**	**D**
Gwg5C2	**Glynwood clay loam, ground morain, 6 to 12 % slopes, eroded**	**D**
Pm	**Pewamo silty clay loam**	**C/d**

Are any endangered species or endangered species habitats located on the beneficial use site?

☐ Yes	■ No

If "Yes" is marked, list the types of endangered species or endangered species habitat:

Have biosolids been beneficially used on the site since July 20, 1993?

☐ Yes	■ No

If "Yes" is marked, list the biosolids generators and years beneficial use occurred:

Generator	Year of Beneficial Use

The application must also include all of the following.

- ■ A soil map of the proposed beneficial use site.
- ■ An aerial map of the proposed beneficial use site that clearly identifies the entrance of the beneficial use site from the nearest road and all applicable isolation distances as established in Chapter 3745-40 of the Ohio Administrative Code.
- ■ A vicinity road map at or near the township level that clearly identifies the proposed beneficial use site with all roads labeled.
- ■ A copy of the most recent soil test results identified in this form.

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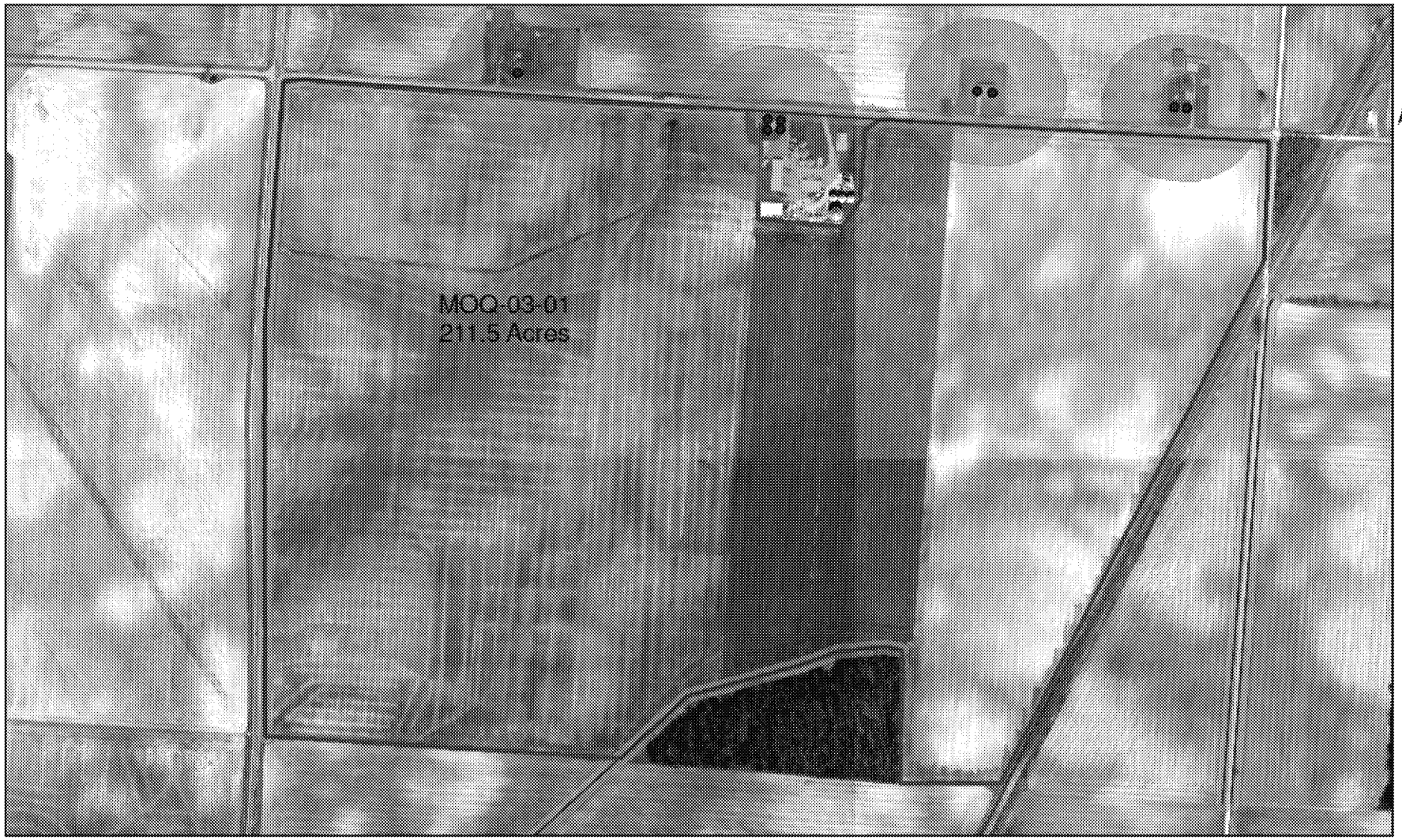
MOQ-03-01



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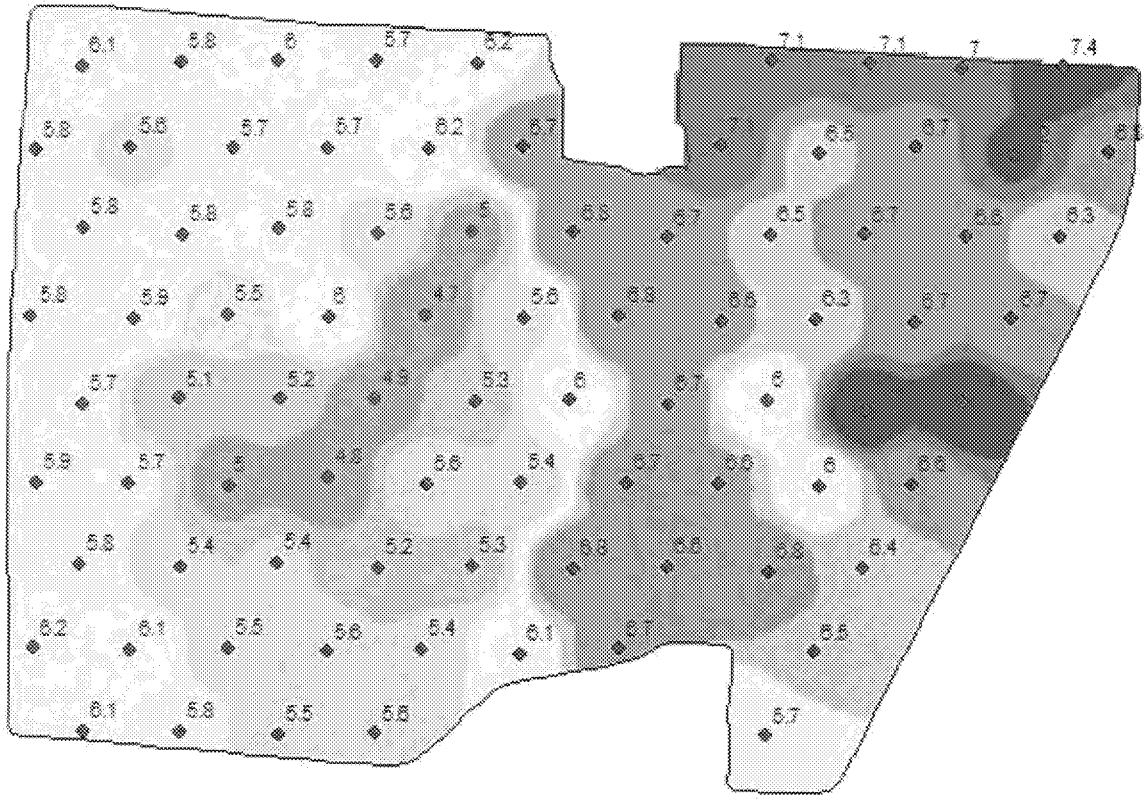
MOQ-03-01

Home -
Soil Test pH (Water, 1:1)



0 384 768 1152 1536 ft

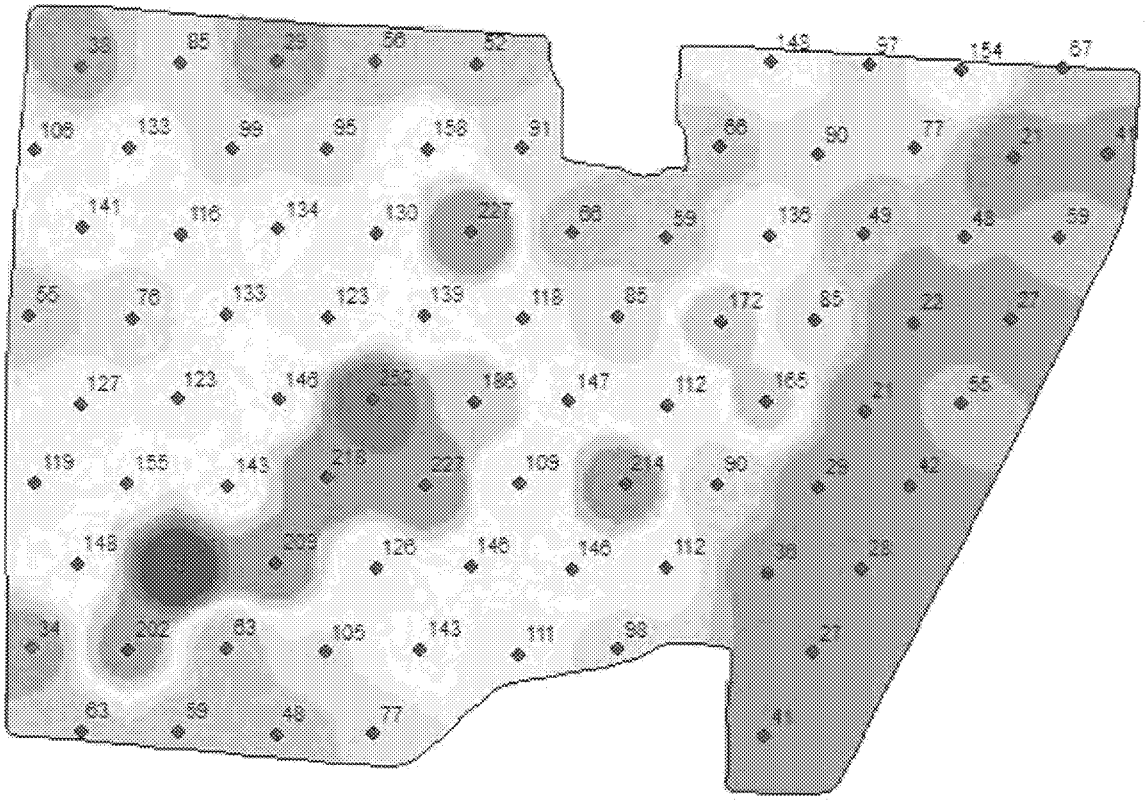
Customer: Etgen Farms
Phone: 740-747-2897
Address: 1673 Co Rd 159 Ashley, Ohio 43003
Boundary Area: 211.17 (ac)
Min: 4.7 (pH)
Avg: 6.1 (pH)
Max: 7.4 (pH)
Std. Dev: 0.6 (pH)
Sample Depth: 0 (in) - 6 (in)
Start Date: 9/21/2012 1:43:00 PM
End Date: 9/21/2012 1:43:00 PM

pH	ac	%
4.7 - 5.1	10.13	4.75
5.1 - 5.4	15.12	7.09
5.4 - 5.6	30.06	14.09
5.6 - 5.9	45.39	21.29
5.9 - 6.3	26.20	12.29
6.3 - 6.5	21.34	10.01
6.5 - 6.9	46.19	21.66
6.9 - 7.2	12.25	5.74
7.2 - 7.4	6.57	3.08

pH Water 1:1
Field Boundary

OHIGRO Inc. Ohigro Inc.-Waldo
740-726-2429

Home -
Soil Test Phosphorus (Bray P-1, 1:1)



Customer: Etgen Farms
Phone: 740-747-2897
Address: 1673 Co Rd 159
Ashley, Ohio 43003
Boundary Area: 211.17 (ac)
Min: 21 (lb/ac)
Avg: 104 (lb/ac)
Max: 301 (lb/ac)
Std. Dev: 55 (lb/ac)
Sample Depth: 0 (in) - 6 (in)
Start Date: 9/21/2012 1:43:00 PM
End Date: 9/21/2012 1:43:00 PM

lb/ac	ac	%
21 - 46	38.02	17.83
46 - 74	35.52	16.66
74 - 105	35.55	16.67
105 - 132	40.90	19.18
132 - 158	35.77	16.78
158 - 192	11.28	5.29
192 - 228	12.16	5.70
228 - 267	2.61	1.22
267 - 301	1.44	0.68
P Bray1		
Field Boundary		

OHIGRO Inc. Ohigro Inc.-Waldo
740-726-2429

SGIS Report 49

2/27/2014

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Morrow County, Ohio

MOQ-03-01

March 4, 2014

Custom Soil Resource Report
Soil Map

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Morrow County, Ohio
Survey Area Data: Version 12, Dec 17, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 5, 2011—Mar 10, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Morrow County, Ohio (OH117)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
Blg1A1	Blount silt loam, ground moraine, 0 to 2 percent slopes	41.8	19.4%
Blg1B1	Blount silt loam, ground moraine, 2 to 4 percent slopes	1.6	0.8%
Gwd1B1	Glynwood silt loam, 2 to 6 percent slopes	28.6	13.3%
Gwg5C2	Glynwood clay loam, ground moraine, 6 to 12 percent slopes, eroded	0.8	0.4%
Pm	Pewamo silty clay loam	142.1	66.1%
Totals for Area of Interest		**215.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

Morrow County, Ohio

Blg1A1—Blount silt loam, ground moraine, 0 to 2 percent slopes

Map Unit Setting

Elevation: 700 to 1,300 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 140 to 180 days

Map Unit Composition

Blount, ground moraine, and similar soils: 85 percent
Minor components: 15 percent

Description of Blount, Ground Moraine

Setting

Landform: Ground moraines on till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 31 to 54 inches to densic material
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 6.2 inches)

Interpretive groups

Farmland classification: Prime farmland if drained
Land capability (nonirrigated): 2w
Hydrologic Soil Group: D

Typical profile

0 to 10 inches: Silt loam
10 to 33 inches: Silty clay
33 to 39 inches: Clay loam
39 to 79 inches: Clay loam

Minor Components

Pewamo, ground moraine

Percent of map unit: 9 percent
Landform: Ground moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear

Across-slope shape: Linear, concave

Glynwood, ground moraine

Percent of map unit: 6 percent
Landform: Ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Linear

BlgB1—Blount silt loam, ground moraine, 2 to 4 percent slopes

Map Unit Setting

Elevation: 700 to 1,300 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 140 to 180 days

Map Unit Composition

Blount, ground moraine, and similar soils: 85 percent
Minor components: 15 percent

Description of Blount, Ground Moraine

Setting

Landform: Ground moraines on till plains
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Properties and qualities

Slope: 2 to 4 percent
Depth to restrictive feature: 30 to 54 inches to densic material
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Low (about 5.6 inches)

Interpretive groups

Farmland classification: Prime farmland if drained
Land capability (nonirrigated): 2e
Hydrologic Soil Group: D

Typical profile

0 to 9 inches: Silt loam
9 to 32 inches: Silty clay
32 to 37 inches: Clay loam
37 to 79 inches: Clay loam

Minor Components

Pewamo, ground moraine

Percent of map unit: 9 percent
Landform: Ground moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave

Glynwood, ground moraine

Percent of map unit: 6 percent
Landform: Ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear

Gwd1B1—Glynwood silt loam, 2 to 6 percent slopes

Map Unit Setting

Elevation: 750 to 1,300 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent

Description of Glynwood

Setting

Landform: Ground moraines
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey till

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 30 to 42 inches to densic material
Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water capacity: Low (about 5.5 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 2e
Hydrologic Soil Group: D
Other vegetative classification: Trees/Timber (Woody Vegetation)

Typical profile

0 to 9 inches: Silt loam
9 to 29 inches: Clay
29 to 36 inches: Clay loam
36 to 80 inches: Clay loam

Minor Components

Blount

Percent of map unit: 8 percent
Landform: Flats on ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)

Pewamo

Percent of map unit: 7 percent
Landform: Depressions on till plains
Landform position (two-dimensional): Toeslope
Down-slope shape: Concave
Across-slope shape: Linear
Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)

Gwg5C2—Glynwood clay loam, ground moraine, 6 to 12 percent slopes, eroded

Map Unit Setting

Elevation: 750 to 1,300 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent

Description of Glynwood

Setting

Landform: Ground moraines
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey till

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 24 to 36 inches to densic material
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water capacity: Low (about 4.3 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 3e
Hydrologic Soil Group: D
Other vegetative classification: Trees/Timber (Woody Vegetation)

Typical profile

0 to 7 inches: Clay loam
7 to 24 inches: Clay
24 to 29 inches: Clay loam
29 to 80 inches: Clay loam

Minor Components

Blount

Percent of map unit: 8 percent
Landform: Flats on ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)

Pewamo

Percent of map unit: 7 percent
Landform: Depressions on till plains
Landform position (two-dimensional): Toeslope
Down-slope shape: Concave
Across-slope shape: Linear
Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)

Pm—Pewamo silty clay loam

Map Unit Setting

Elevation: 600 to 1,400 feet
Mean annual precipitation: 29 to 42 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days

Map Unit Composition

Pewamo and similar soils: 85 percent
Minor components: 15 percent

Description of Pewamo

Setting

Landform: Drainageways, depressions
Parent material: Till

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water capacity: High (about 10.2 inches)

Interpretive groups

Farmland classification: Prime farmland if drained
Land capability (nonirrigated): 2w
Hydrologic Soil Group: C/D

Typical profile

0 to 15 inches: Silty clay loam
15 to 66 inches: Silty clay loam
66 to 80 inches: Clay loam

Minor Components

Blount

Percent of map unit: 3 percent
Landform: Flats on end moraines, rises on ground moraines, rises on end moraines, flats on ground moraines
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Linear
Across-slope shape: Linear

Sloan

Percent of map unit: 3 percent
Landform: Flood plains

Condit

Percent of map unit: 3 percent
Landform: Depressions on ground moraines
Down-slope shape: Concave
Across-slope shape: Concave

Carlisle

Percent of map unit: 3 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave

Bennington

Percent of map unit: 3 percent
Landform: Rises on end moraines, rises on ground moraines, flats on ground moraines, flats on end moraines
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Linear
Across-slope shape: Linear

Thinner or lighter colored surface layer

Percent of map unit:
Landform: Depressions, drainageways

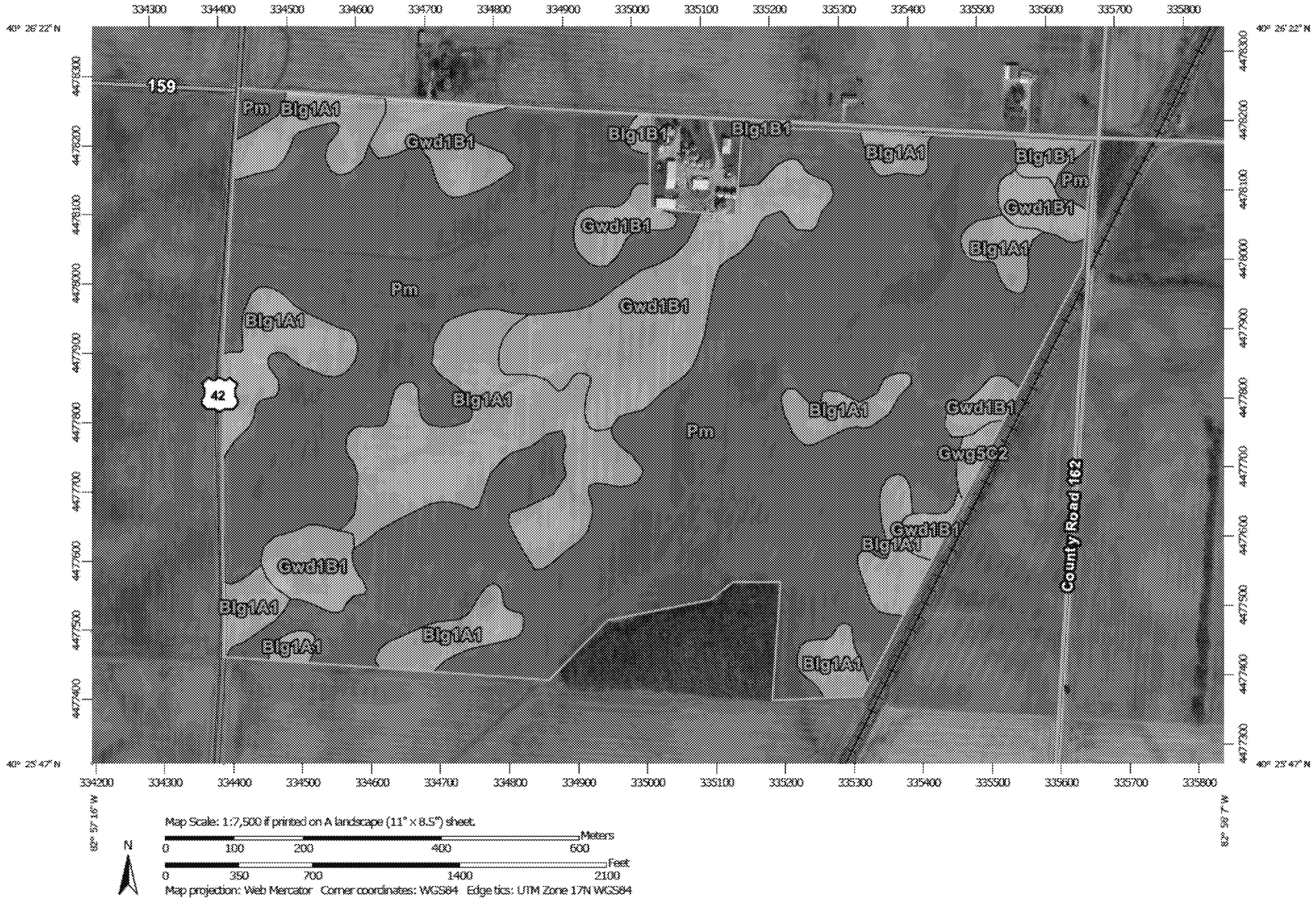
More sand and less clay in the subsoil

Percent of map unit:
Landform: Drainageways, depressions

Slopes of 3 or 4 percent

Percent of map unit:
Landform: Drainageways, depressions

Map—Depth to Any Soil Restrictive Layer (MOQ-03-01)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Morrow County, Ohio
Survey Area Data: Version 12, Dec 17, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 5, 2011—Mar 10, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Depth to Any Soil Restrictive Layer (MOQ-03-01)

Depth to Any Soil Restrictive Layer— Summary by Map Unit — Morrow County, Ohio (OH117)				
Map unit symbol	**Map unit name**	**Rating (centimeters)**	**Acres in AOI**	**Percent of AOI**
Blg1A1	Blount silt loam, ground moraine, 0 to 2 percent slopes	99	41.8	19.4%
Blg1B1	Blount silt loam, ground moraine, 2 to 4 percent slopes	94	1.6	0.8%
Gwd1B1	Glynwood silt loam, 2 to 6 percent slopes	91	28.6	13.3%
Gwg5C2	Glynwood clay loam, ground moraine, 6 to 12 percent slopes, eroded	74	0.8	0.4%
Pm	Pewamo silty clay loam	>200	142.1	66.1%
Totals for Area of Interest			**215.0**	**100.0%**

Rating Options—Depth to Any Soil Restrictive Layer (MOQ-03-01)

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Hydrologic Soil Group (MOQ-03-01)

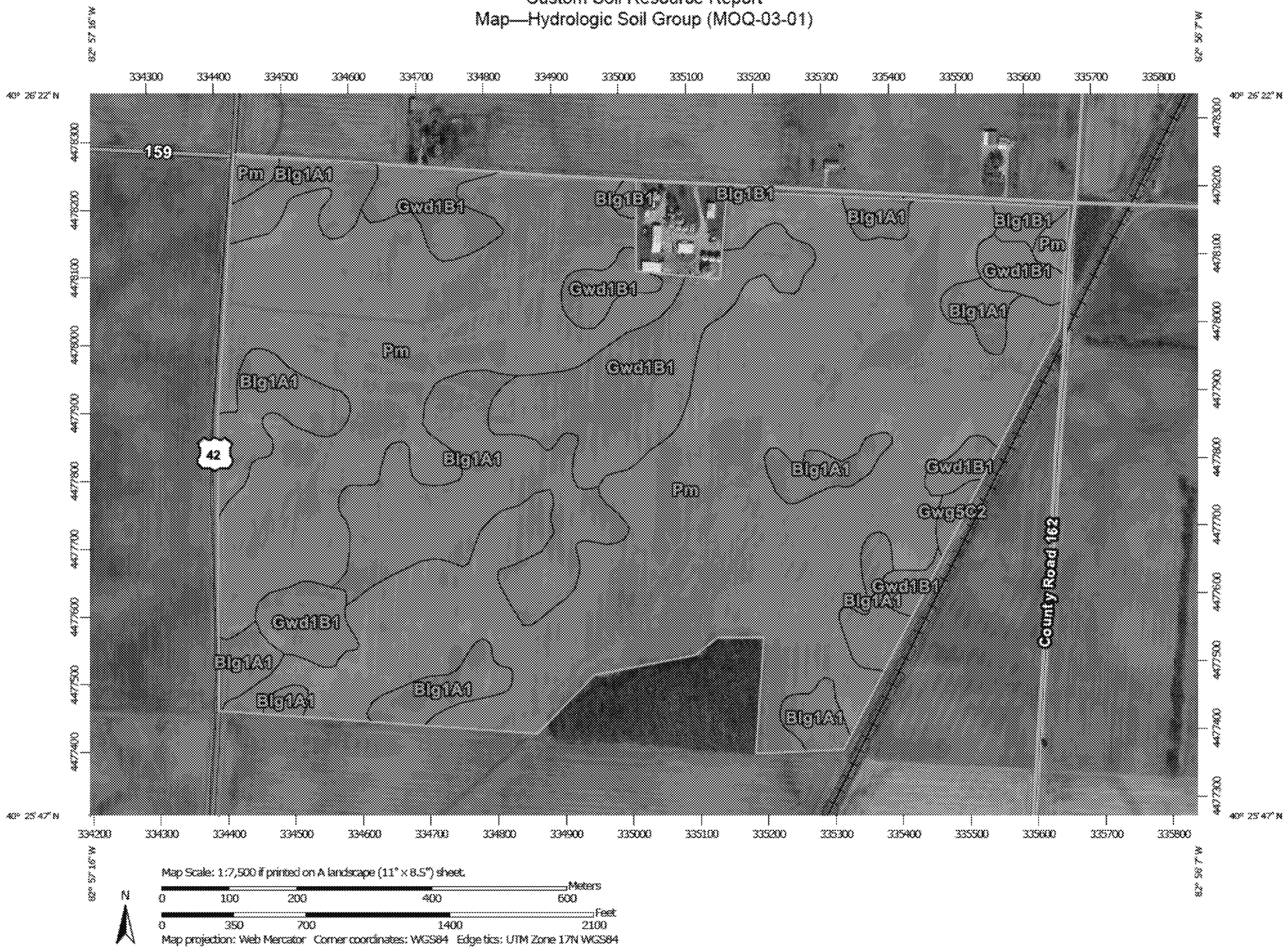
Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Custom Soil Resource Report
Map—Hydrologic Soil Group (MOQ-03-01)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Morrow County, Ohio
Survey Area Data: Version 12, Dec 17, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 5, 2011—Mar 10, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group (MOQ-03-01)

Hydrologic Soil Group— Summary by Map Unit — Morrow County, Ohio (OH117)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
Blg1A1	Blount silt loam, ground moraine, 0 to 2 percent slopes	D	41.8	19.4%
Blg1B1	Blount silt loam, ground moraine, 2 to 4 percent slopes	D	1.6	0.8%
Gwd1B1	Glynwood silt loam, 2 to 6 percent slopes	D	28.6	13.3%
Gwg5C2	Glynwood clay loam, ground moraine, 6 to 12 percent slopes, eroded	D	0.8	0.4%
Pm	Pewamo silty clay loam	C/D	142.1	66.1%
Totals for Area of Interest			**215.0**	**100.0%**

Rating Options—Hydrologic Soil Group (MOQ-03-01)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

quasar energy group

Form BUA-4 Page 1 of 2

Beneficial Use Site Information

Ohio EPA Site I.D. (Ohio EPA Use Only)

Field site I.D.: **MOQ-03-02**	
Beneficial use site location: **South of Westfield Fulton Rd East of Township Rd 162**	
County: **Morrow**	Township: **Westfield**
Latitude: **40°25'55.69"N**	Longitude: **82°56'20.77"W**

Total acreage proposed for beneficial use: **19.0 acres**	
Soil pH (s.u.): **6.9**	Soil phosphorus (mg/kg): **29** Bray Kurtz P1 ■ Mehlich 3 ☐
Bedrock depth (feet): **>3'**	

Type of crops to be grown:

Crop Type	Expected Yield
Corn	**185 bu**
Soybeans	**60 bu**
Wheat	
Pasture	
Hay	
Other:	

Soil Types:

Soil Unit Symbol	Soil Unit Name	Hydrologic Soil Group
Blg1A1	**Blount silt loam, ground moraine, 0 to 2 %slopes**	**D**
Gwd1B1	**Glynwood silt loam, 2 to 6 % slopes**	**D**
Gwg5C2	**Glynwood clay loam, ground moraine, 6 to 12 % slopes, eroded**	**D**
Pm	**Pewamo silty clay loam**	**C/D**

Are any endangered species or endangered species habitats located on the beneficial use site?

☐ Yes	■ No

If "Yes" is marked, list the types of endangered species or endangered species habitat:

Have biosolids been beneficially used on the site since July 20, 1993?

☐ Yes	■ No

If "Yes" is marked, list the biosolids generators and years beneficial use occurred:

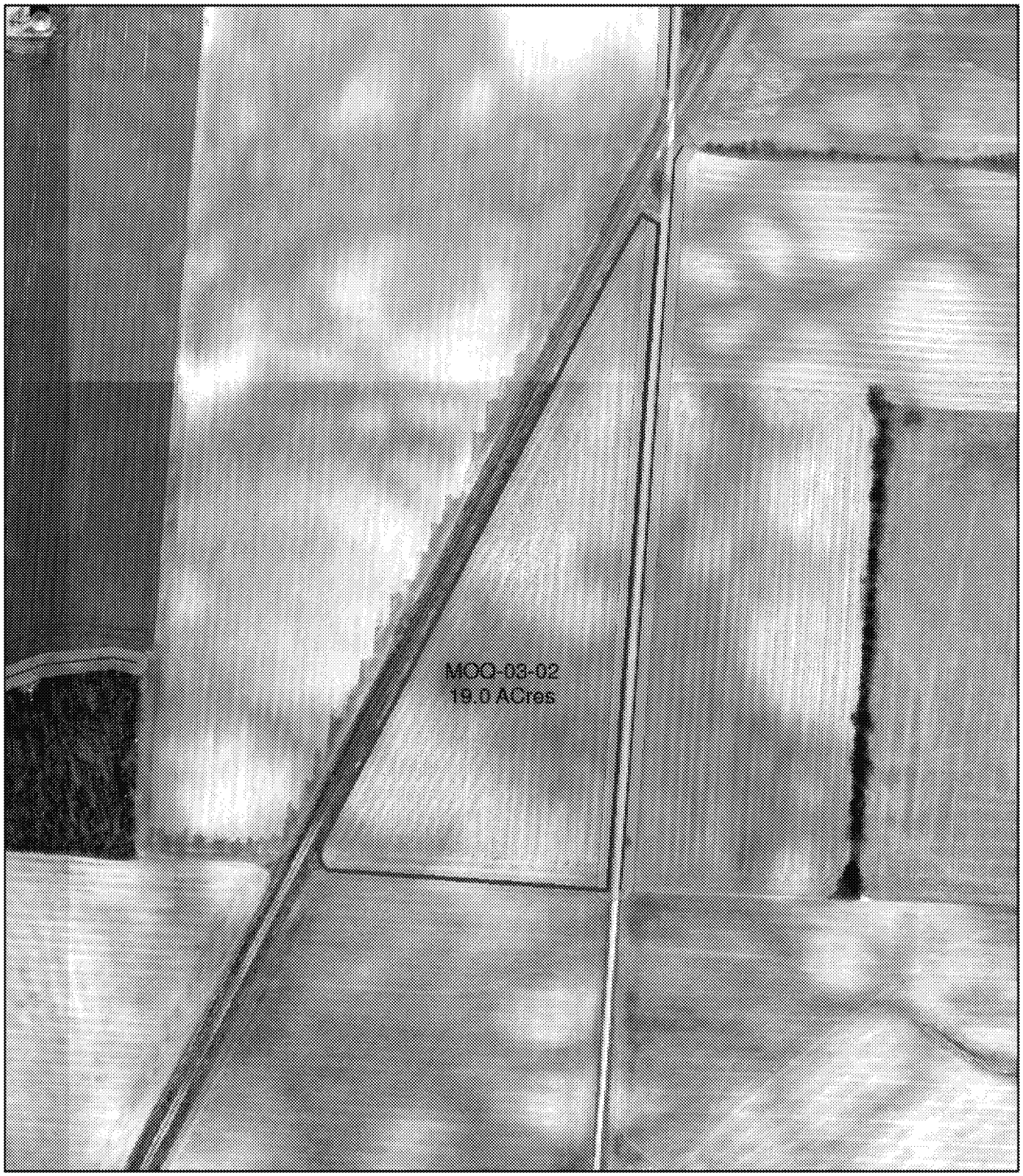
Generator	Year of Beneficial Use

The application must also include all of the following.

- ■ A soil map of the proposed beneficial use site.
- ■ An aerial map of the proposed beneficial use site that clearly identifies the entrance of the beneficial use site from the nearest road and all applicable isolation distances as established in Chapter 3745-40 of the Ohio Administrative Code.
- ■ A vicinity road map at or near the township level that clearly identifies the proposed beneficial use site with all roads labeled.
- ■ A copy of the most recent soil test results identified in this form.

quasar
energy group

MOQ-03-02



N

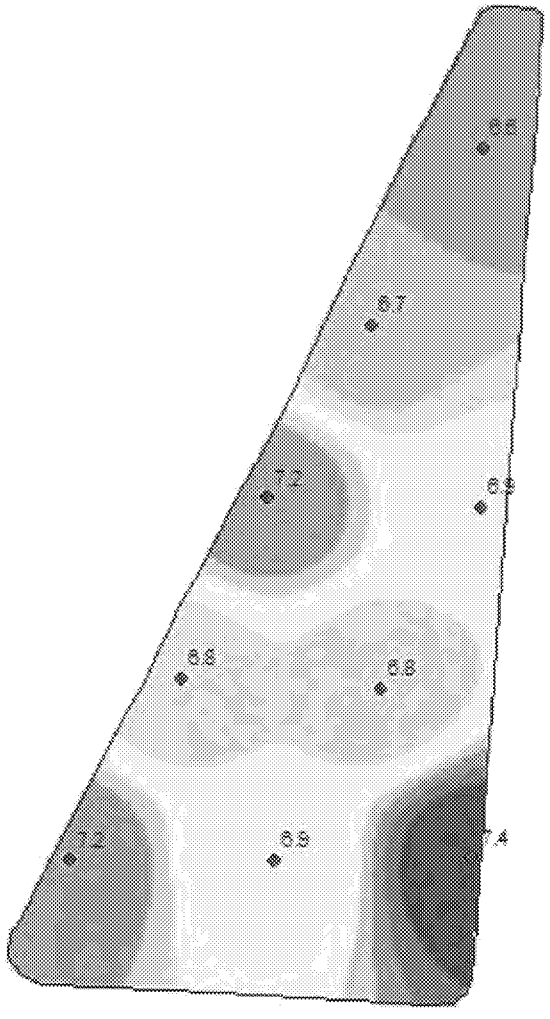
Feet
0 150 300 600 900 1,200

Residence
Watercourse
100 ft Buffer
300 ft Buffer
33 ft Buffer

quasar
energy group

MOQ-03-02

Home -
Soil Test pH (Water, 1:1)



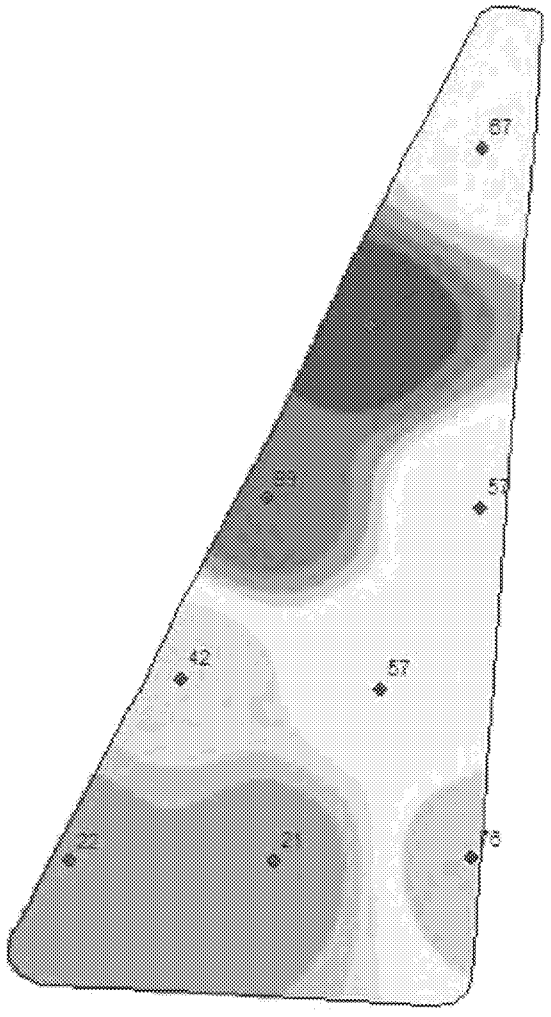
Customer: Etgen Farms
Phone: 740-747-2897
Address: 1673 Co Rd 159
Ashley, Ohio 43003
Boundary Area: 18.58 (ac)
Min: 6.6 (pH)
Avg: 6.9 (pH)
Max: 7.4 (pH)
Std. Dev: 0.2 (pH)
Sample Depth: 0 (in) - 6 (in)
Start Date: 8/2/2013 2:26:00 PM
End Date: 8/2/2013 2:26:00 PM

pH	ac	%
6.6 - 6.7	1.91	10.11
6.7 - 6.8	1.83	9.98
6.8 - 6.9	3.67	19.42
6.9 - 6.9	4.49	23.76
6.9 - 7.0	1.61	8.53
7.0 - 7.1	1.26	6.69
7.1 - 7.2	2.77	14.67
7.2 - 7.3	0.44	2.34
7.3 - 7.4	0.85	4.50

pH Water 1:1
Field Boundary

OHIGRO Inc. Ohigro Inc.-Waldo
740-726-2429

Home -
Soil Test Phosphorus (Bray P-1, 1:1)



Customer: Etgen Farms
Phone: 740-747-2897
Address: 1673 Co Rd 159
Ashley, Ohio 43003
Boundary Area: 18.58 (ac)
Min: 21 (lb/ac)
Avg: 58 (lb/ac)
Max: 106 (lb/ac)
Std. Dev: 26 (lb/ac)
Sample Depth: 0 (in) - 6 (in)
Start Date: 8/2/2013 2:26:00 PM
End Date: 8/2/2013 2:26:00 PM

lb/ac	ac	%
21 - 27	4.11	21.75
27 - 38	0.87	4.62
38 - 50	1.83	9.67
50 - 62	3.95	20.91
62 - 71	2.65	14.05
71 - 80	1.58	8.36
80 - 92	0.92	4.85
92 - 101	1.71	9.07
101 - 106	1.27	6.72
P Bray1		
Field Boundary		

OHIGRO Inc. Ohigro Inc.-Waldo
740-726-2429

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Morrow County, Ohio

MOQ-03-02

March 4, 2014

Custom Soil Resource Report
Soil Map

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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Map Unit Legend

Morrow County, Ohio (OH117)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
Blg1A1	Blount silt loam, ground moraine, 0 to 2 percent slopes	4.5	23.8%
Gwd1B1	Glynwood silt loam, 2 to 6 percent slopes	3.8	20.2%
Gwg5C2	Glynwood clay loam, ground moraine, 6 to 12 percent slopes, eroded	1.3	7.1%
Pm	Pewamo silty clay loam	9.1	48.9%
Totals for Area of Interest		**18.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic

Morrow County, Ohio

BlgA1—Blount silt loam, ground moraine, 0 to 2 percent slopes

Map Unit Setting

Elevation: 700 to 1,300 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 140 to 180 days

Map Unit Composition

Blount, ground moraine, and similar soils: 85 percent
Minor components: 15 percent

Description of Blount, Ground Moraine

Setting

Landform: Ground moraines on till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 31 to 54 inches to densic material
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 6.2 inches)

Interpretive groups

Farmland classification: Prime farmland if drained
Land capability (nonirrigated): 2w
Hydrologic Soil Group: D

Typical profile

0 to 10 inches: Silt loam
10 to 33 inches: Silty clay
33 to 39 inches: Clay loam
39 to 79 inches: Clay loam

Minor Components

Pewamo, ground moraine

Percent of map unit: 9 percent
Landform: Ground moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear

Across-slope shape: Linear, concave

Glynwood, ground moraine

Percent of map unit: 6 percent
Landform: Ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Linear

Gwd1B1—Glynwood silt loam, 2 to 6 percent slopes

Map Unit Setting

Elevation: 750 to 1,300 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent

Description of Glynwood

Setting

Landform: Ground moraines
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey till

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 30 to 42 inches to densic material
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water capacity: Low (about 5.5 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 2e
Hydrologic Soil Group: D
Other vegetative classification: Trees/Timber (Woody Vegetation)

Typical profile

0 to 9 inches: Silt loam
9 to 29 inches: Clay
29 to 36 inches: Clay loam
36 to 80 inches: Clay loam

Minor Components

Blount

Percent of map unit: 8 percent
Landform: Flats on ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)

Pewamo

Percent of map unit: 7 percent
Landform: Depressions on till plains
Landform position (two-dimensional): Toeslope
Down-slope shape: Concave
Across-slope shape: Linear
Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)

Gwg5C2—Glynwood clay loam, ground moraine, 6 to 12 percent slopes, eroded

Map Unit Setting

Elevation: 750 to 1,300 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent

Description of Glynwood

Setting

Landform: Ground moraines
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey till

Properties and qualities

Slope: 6 to 12 percent

Depth to restrictive feature: 24 to 36 inches to densic material
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water capacity: Low (about 4.3 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 3e
Hydrologic Soil Group: D
Other vegetative classification: Trees/Timber (Woody Vegetation)

Typical profile

0 to 7 inches: Clay loam
7 to 24 inches: Clay
24 to 29 inches: Clay loam
29 to 80 inches: Clay loam

Minor Components

Blount

Percent of map unit: 8 percent
Landform: Flats on ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)

Pewamo

Percent of map unit: 7 percent
Landform: Depressions on till plains
Landform position (two-dimensional): Toeslope
Down-slope shape: Concave
Across-slope shape: Linear
Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)

Pm—Pewamo silty clay loam

Map Unit Setting

Elevation: 600 to 1,400 feet
Mean annual precipitation: 29 to 42 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days

Map Unit Composition

Pewamo and similar soils: 85 percent

Minor components: 15 percent

Description of Pewamo

Setting

Landform: Drainageways, depressions
Parent material: Till

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water capacity: High (about 10.2 inches)

Interpretive groups

Farmland classification: Prime farmland if drained
Land capability (nonirrigated): 2w
Hydrologic Soil Group: C/D

Typical profile

0 to 15 inches: Silty clay loam
15 to 66 inches: Silty clay loam
66 to 80 inches: Clay loam

Minor Components

Blount

Percent of map unit: 3 percent
Landform: Flats on end moraines, rises on ground moraines, rises on end moraines, flats on ground moraines
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Linear
Across-slope shape: Linear

Sloan

Percent of map unit: 3 percent
Landform: Flood plains

Condit

Percent of map unit: 3 percent
Landform: Depressions on ground moraines
Down-slope shape: Concave
Across-slope shape: Concave

Carlisle

Percent of map unit: 3 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave

Bennington

Percent of map unit: 3 percent

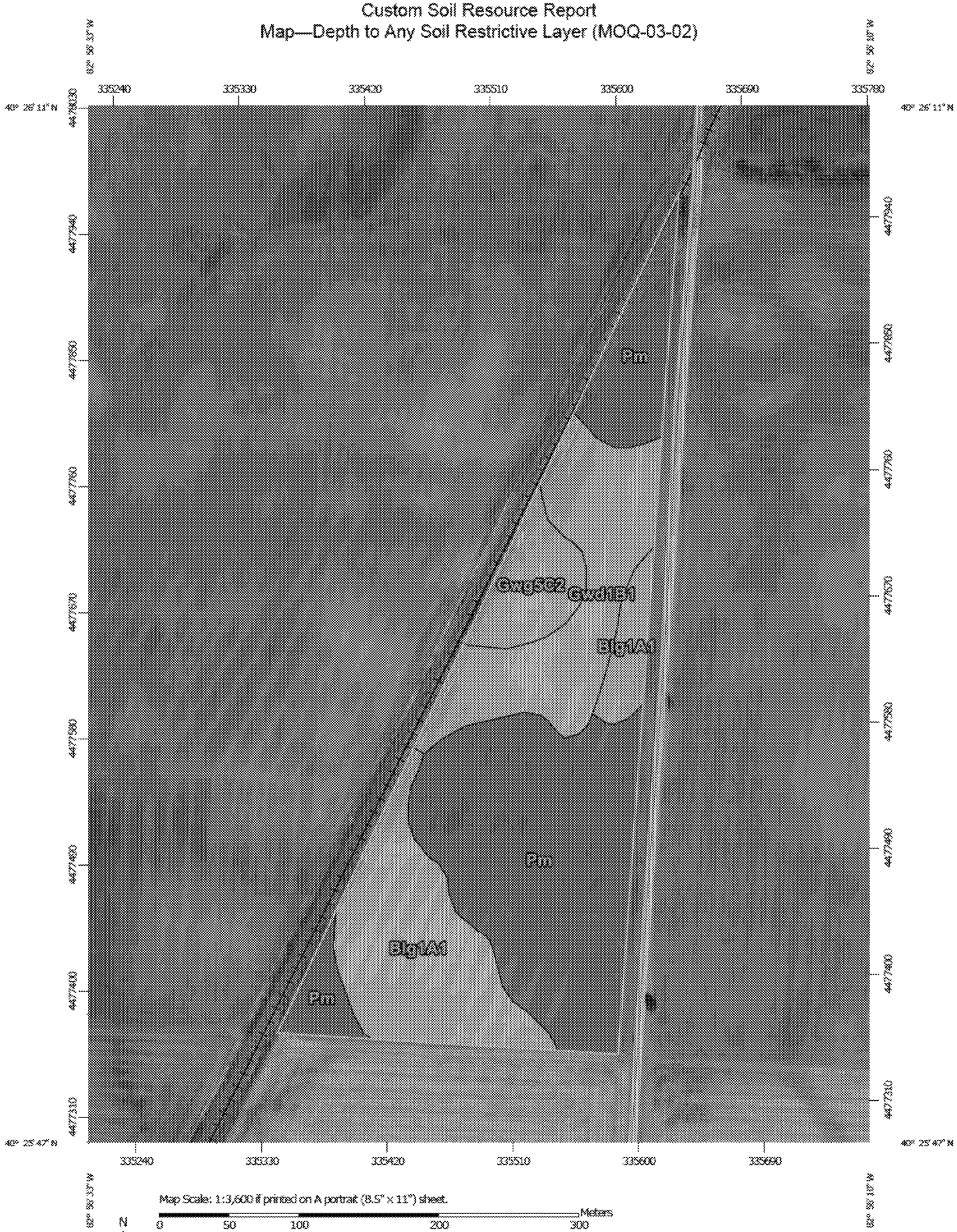
Landform: Rises on end moraines, rises on ground moraines, flats on ground moraines, flats on end moraines
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Linear
Across-slope shape: Linear

Thinner or lighter colored surface layer
Percent of map unit:
Landform: Depressions, drainageways

More sand and less clay in the subsoil
Percent of map unit:
Landform: Drainageways, depressions

Slopes of 3 or 4 percent
Percent of map unit:
Landform: Drainageways, depressions

Custom Soil Resource Report
Map—Depth to Any Soil Restrictive Layer (MOQ-03-02)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

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Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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Table—Depth to Any Soil Restrictive Layer (MOQ-03-02)

Depth to Any Soil Restrictive Layer— Summary by Map Unit — Morrow County, Ohio (OH117)				
Map unit symbol	**Map unit name**	**Rating (centimeters)**	**Acres in AOI**	**Percent of AOI**
Blg1A1	Blount silt loam, ground moraine, 0 to 2 percent slopes	99	4.5	23.8%
Gwd1B1	Glynwood silt loam, 2 to 6 percent slopes	91	3.8	20.2%
Gwg5C2	Glynwood clay loam, ground moraine, 6 to 12 percent slopes, eroded	74	1.3	7.1%
Pm	Pewamo silty clay loam	>200	9.1	48.9%
Totals for Area of Interest			**18.7**	**100.0%**

Rating Options—Depth to Any Soil Restrictive Layer (MOQ-03-02)

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Hydrologic Soil Group (MOQ-03-02)

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils

Custom Soil Resource Report
Map—Hydrologic Soil Group (MOQ-03-02)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Morrow County, Ohio
Survey Area Data: Version 12, Dec 17, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 5, 2011—Mar 10, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group (MOQ-03-02)

Hydrologic Soil Group— Summary by Map Unit — Morrow County, Ohio (OH117)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
Blg1A1	Blount silt loam, ground moraine, 0 to 2 percent slopes	D	4.5	23.8%
Gwd1B1	Glynwood silt loam, 2 to 6 percent slopes	D	3.8	20.2%
Gwg5C2	Glynwood clay loam, ground moraine, 6 to 12 percent slopes, eroded	D	1.3	7.1%
Pm	Pewamo silty clay loam	C/D	9.1	48.9%
Totals for Area of Interest			**18.7**	**100.0%**

Rating Options—Hydrologic Soil Group (MOQ-03-02)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

quasar energy group

Form BUA-4 Page 1 of 2

Beneficial Use Site Information

Ohio EPA Site I.D. (Ohio EPA Use Only)

Field site I.D.: **MOQ-03-03**	
Beneficial use site location: **South of Westfield Fulton Rd East of Township Rd 162**	
County: **Morrow**	Township: **Westfield**
Latitude: **40°26'5.43"N**	Longitude: **82°56'9.85"W**

Total acreage proposed for beneficial use: **40.0 acres**	
Soil pH (s.u.): **6.8**	Soil phosphorus (mg/kg): **26.5** Bray Kurtz P1 ■ Mehlich 3 ☐
Bedrock depth (feet): **>3'**	

Type of crops to be grown:

Crop Type	Expected Yield
Corn	**185 bu**
Soybeans	**60 bu**
Wheat	
Pasture	
Hay	
Other:	

Soil Types:

Soil Unit Symbol	Soil Unit Name	Hydrologic Soil Group
Blg1A1	**Blount silt loam, ground moraine, 0 to 2 % slopes**	**D**
Blg1B1	**Blount silt loam, ground moraine, 2 to 4 % slopes**	**D**
Pm	**Pewamo silty clay loam**	**C/D**
Gwd1B1	**Glynwood silt loam, 2 to 6 % slopes**	**D**

Are any endangered species or endangered species habitats located on the beneficial use site?

☐ Yes	■ No

If "Yes" is marked, list the types of endangered species or endangered species habitat:

Have biosolids been beneficially used on the site since July 20, 1993?

☐ Yes	■ No

If "Yes" is marked, list the biosolids generators and years beneficial use occurred:

Generator	Year of Beneficial Use

The application must also include all of the following.

- ■ A soil map of the proposed beneficial use site.
- ■ An aerial map of the proposed beneficial use site that clearly identifies the entrance of the beneficial use site from the nearest road and all applicable isolation distances as established in Chapter 3745-40 of the Ohio Administrative Code.
- ■ A vicinity road map at or near the township level that clearly identifies the proposed beneficial use site with all roads labeled.
- ■ A copy of the most recent soil test results identified in this form.

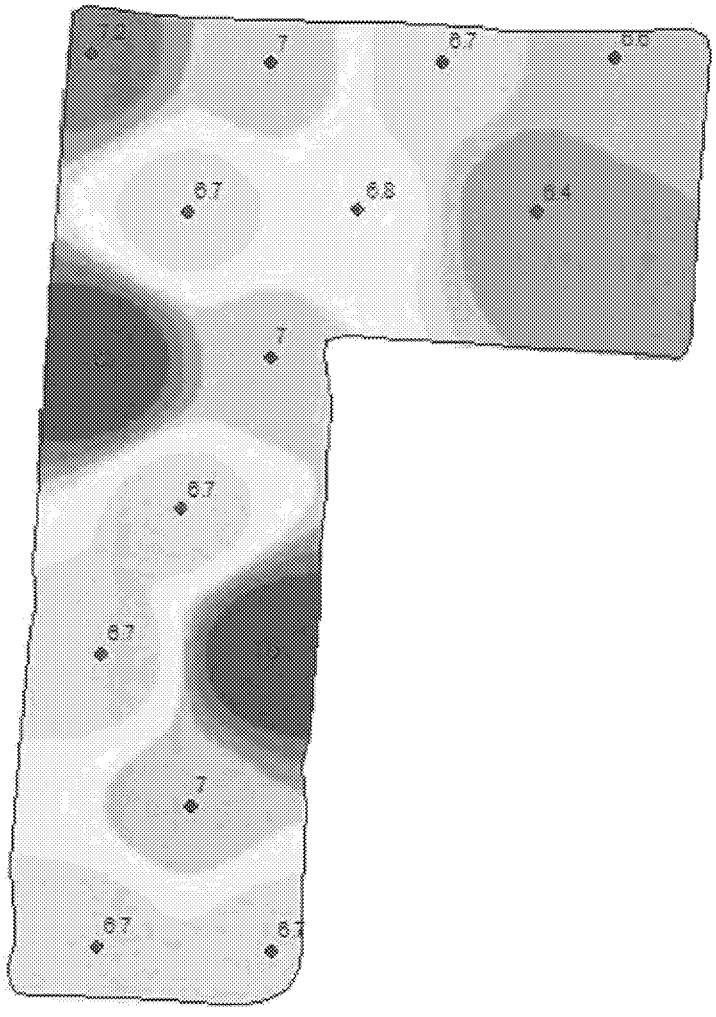
quasar
energy group

MOQ-03-03

quasar
energy group

MOQ-03-03

Home -
Soil Test pH (Water, 1:1)



0 217 434 651 869 ft

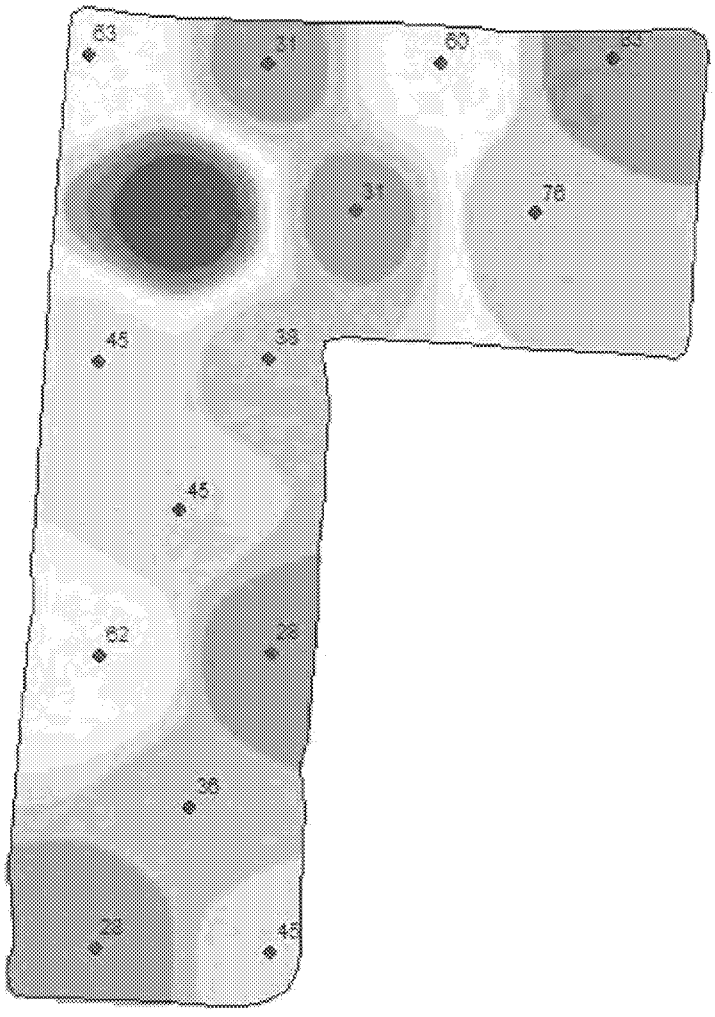
Customer: Etgen Farms
Phone: 740-747-2897
Address: 1673 Co Rd 159
Ashley, Ohio 43003
Boundary Area: 38.48 (ac)
Min: 6.4 (pH)
Avg: 6.8 (pH)
Max: 7.4 (pH)
Std. Dev: 0.2 (pH)
Sample Depth: 0 (in) - 6 (in)
Start Date: 8/2/2013 2:26:00 PM
End Date: 8/2/2013 2:26:00 PM

pH	ac	%
6.4 - 6.5	4.34	11.14
6.5 - 6.6	2.91	7.46
6.6 - 6.8	10.38	26.59
6.8 - 6.8	5.57	14.29
6.8 - 6.9	3.07	7.89
6.9 - 7.0	6.30	16.19
7.0 - 7.1	1.42	3.65
7.1 - 7.3	2.04	5.24
7.3 - 7.4	2.95	7.56

◆ pH Water 1:1
Field Boundary

OHIGRO Inc. Ohigro Inc.-Waldo
740-726-2429

Home -
Soil Test Phosphorus (Bray P-1, 1:1)



Customer: Etgen Farms
Phone: 740-747-2897
Address: 1673 Co Rd 159
Ashley, Ohio 43003
Boundary Area: 38.48 (ac)
Min: 28 (lb/ac)
Avg: 53 (lb/ac)
Max: 101 (lb/ac)
Std. Dev: 19 (lb/ac)
Sample Depth: 0 (in) - 6 (in)
Start Date: 8/2/2013 2:26:00 PM
End Date: 8/2/2013 2:26:00 PM

lb/ac	ac	%
28 - 34	6.33	16.27
34 - 41	7.64	19.61
41 - 49	7.87	20.20
49 - 58	2.35	6.03
58 - 68	5.24	13.46
68 - 78	5.20	13.35
78 - 86	2.56	6.57
86 - 95	0.63	1.62
95 - 101	1.12	2.89
P Bray1		
Field Boundary		

OHIGRO Inc. Ohigro Inc.-Waldo
740-726-2429

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Morrow County, Ohio

MOQ-03-03

March 4, 2014


82° 56' 28" W
82° 55' 55" W
335570
335660
335750
335840
335930
336020
336110
40° 26' 12" N
40° 25' 47" N
4478020
4477930
4477840
4477750
4477660
4477570
4477480
4477390
4477300
BlgA1B1
GwdA1B1
PmA
Map Scale: 1:3,800 if printed on A portrait (8.5" x 11") sheet.
Meters
0
50
100
200
300
Feet
0
150
300
600
900
N
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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Map Unit Legend

Morrow County, Ohio (OH117)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
Blg1A1	Blount silt loam, ground moraine, 0 to 2 percent slopes	5.7	13.6%
Blg1B1	Blount silt loam, ground moraine, 2 to 4 percent slopes	4.9	11.5%
Gwd1B1	Glynwood silt loam, 2 to 6 percent slopes	3.4	7.9%
Pm	Pewamo silty clay loam	28.3	67.0%
Totals for Area of Interest		**42.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that

Morrow County, Ohio

BlgA1—Blount silt loam, ground moraine, 0 to 2 percent slopes

Map Unit Setting

Elevation: 700 to 1,300 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 140 to 180 days

Map Unit Composition

Blount, ground moraine, and similar soils: 85 percent
Minor components: 15 percent

Description of Blount, Ground Moraine

Setting

Landform: Ground moraines on till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 31 to 54 inches to densic material
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 6.2 inches)

Interpretive groups

Farmland classification: Prime farmland if drained
Land capability (nonirrigated): 2w
Hydrologic Soil Group: D

Typical profile

0 to 10 inches: Silt loam
10 to 33 inches: Silty clay
33 to 39 inches: Clay loam
39 to 79 inches: Clay loam

Minor Components

Pewamo, ground moraine

Percent of map unit: 9 percent
Landform: Ground moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear

Across-slope shape: Linear, concave

Glynwood, ground moraine

Percent of map unit: 6 percent
Landform: Ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Linear

BlgB1—Blount silt loam, ground moraine, 2 to 4 percent slopes

Map Unit Setting

Elevation: 700 to 1,300 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 140 to 180 days

Map Unit Composition

Blount, ground moraine, and similar soils: 85 percent
Minor components: 15 percent

Description of Blount, Ground Moraine

Setting

Landform: Ground moraines on till plains
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Properties and qualities

Slope: 2 to 4 percent
Depth to restrictive feature: 30 to 54 inches to densic material
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Low (about 5.6 inches)

Interpretive groups

Farmland classification: Prime farmland if drained
Land capability (nonirrigated): 2e
Hydrologic Soil Group: D

Typical profile

0 to 9 inches: Silt loam
9 to 32 inches: Silty clay
32 to 37 inches: Clay loam
37 to 79 inches: Clay loam

Minor Components

Pewamo, ground moraine

Percent of map unit: 9 percent
Landform: Ground moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave

Glynwood, ground moraine

Percent of map unit: 6 percent
Landform: Ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear

Gwd1B1—Glynwood silt loam, 2 to 6 percent slopes

Map Unit Setting

Elevation: 750 to 1,300 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent

Description of Glynwood

Setting

Landform: Ground moraines
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey till

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 30 to 42 inches to densic material
Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water capacity: Low (about 5.5 inches)

Interpretive groups
Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 2e
Hydrologic Soil Group: D
Other vegetative classification: Trees/Timber (Woody Vegetation)

Typical profile
0 to 9 inches: Silt loam
9 to 29 inches: Clay
29 to 36 inches: Clay loam
36 to 80 inches: Clay loam

Minor Components

Blount
Percent of map unit: 8 percent
Landform: Flats on ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)

Pewamo
Percent of map unit: 7 percent
Landform: Depressions on till plains
Landform position (two-dimensional): Toeslope
Down-slope shape: Concave
Across-slope shape: Linear
Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)

Pm—Pewamo silty clay loam

Map Unit Setting
Elevation: 600 to 1,400 feet
Mean annual precipitation: 29 to 42 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days

Map Unit Composition
Pewamo and similar soils: 85 percent
Minor components: 15 percent

Description of Pewamo

Setting

Landform: Drainageways, depressions
Parent material: Till

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water capacity: High (about 10.2 inches)

Interpretive groups

Farmland classification: Prime farmland if drained
Land capability (nonirrigated): 2w
Hydrologic Soil Group: C/D

Typical profile

0 to 15 inches: Silty clay loam
15 to 66 inches: Silty clay loam
66 to 80 inches: Clay loam

Minor Components

Blount

Percent of map unit: 3 percent
Landform: Flats on end moraines, rises on ground moraines, rises on end moraines, flats on ground moraines
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Linear
Across-slope shape: Linear

Sloan

Percent of map unit: 3 percent
Landform: Flood plains

Condit

Percent of map unit: 3 percent
Landform: Depressions on ground moraines
Down-slope shape: Concave
Across-slope shape: Concave

Carlisle

Percent of map unit: 3 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave

Bennington

Percent of map unit: 3 percent
Landform: Rises on end moraines, rises on ground moraines, flats on ground moraines, flats on end moraines

Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Linear
Across-slope shape: Linear

Thinner or lighter colored surface layer
Percent of map unit:
Landform: Depressions, drainageways

More sand and less clay in the subsoil
Percent of map unit:
Landform: Drainageways, depressions

Slopes of 3 or 4 percent
Percent of map unit:
Landform: Drainageways, depressions

Custom Soil Resource Report
Map—Depth to Any Soil Restrictive Layer (MOQ-03-03)

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
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Table—Depth to Any Soil Restrictive Layer (MOQ-03-03)

Depth to Any Soil Restrictive Layer— Summary by Map Unit — Morrow County, Ohio (OH117)				
Map unit symbol	**Map unit name**	**Rating (centimeters)**	**Acres in AOI**	**Percent of AOI**
Blg1A1	Blount silt loam, ground moraine, 0 to 2 percent slopes	99	5.7	13.6%
Blg1B1	Blount silt loam, ground moraine, 2 to 4 percent slopes	94	4.9	11.5%
Gwd1B1	Glynwood silt loam, 2 to 6 percent slopes	91	3.4	7.9%
Pm	Pewamo silty clay loam	>200	28.3	67.0%
Totals for Area of Interest			**42.2**	**100.0%**

Rating Options—Depth to Any Soil Restrictive Layer (MOQ-03-03)

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Hydrologic Soil Group (MOQ-03-03)

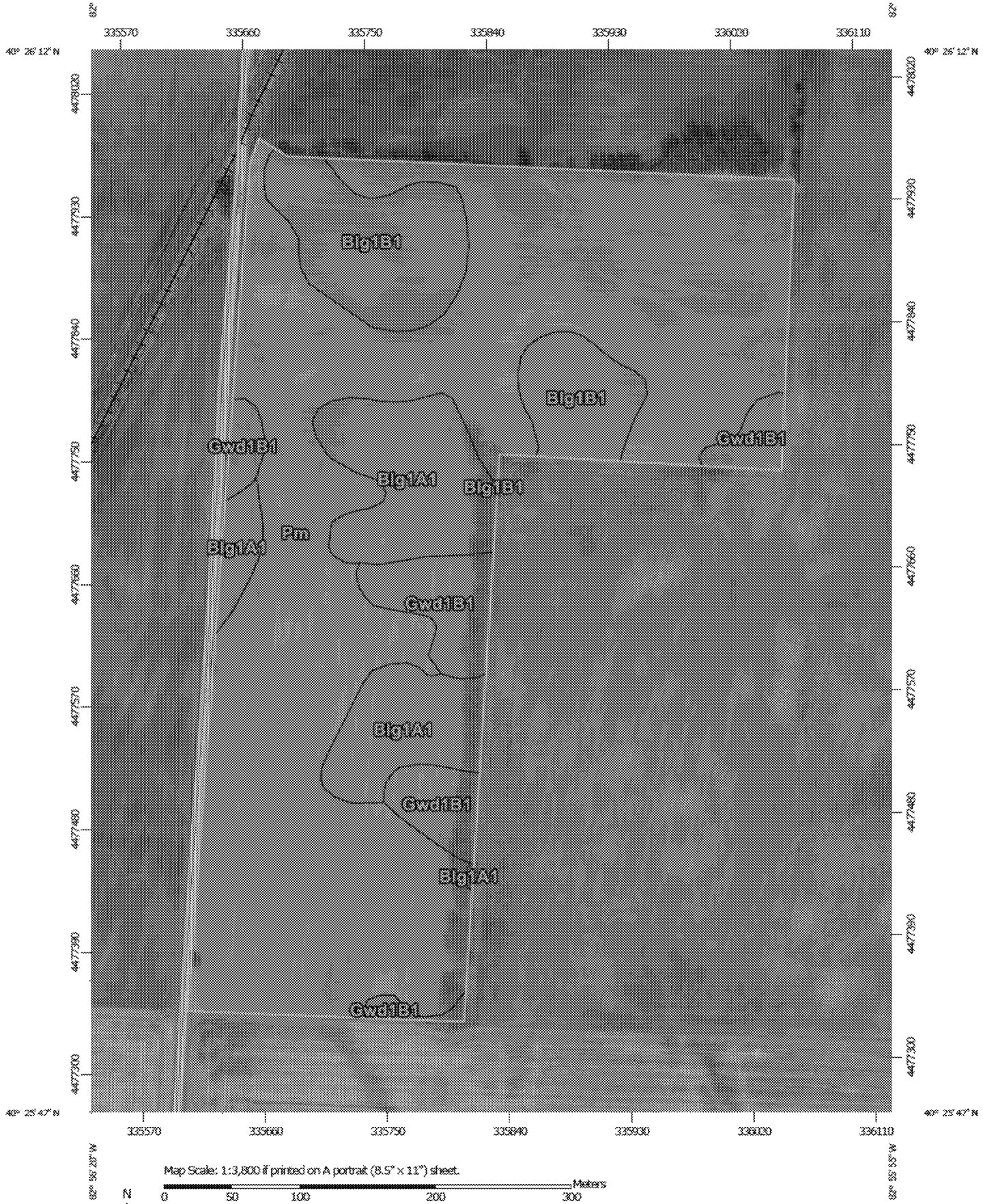
Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils


82° 56' 28" W
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GvcdA1B1
Pm
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N
Meters
0 50 100 200 300
Feet
0 150 300 600 900
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
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- Local Roads

Background
- Aerial Photography

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The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Morrow County, Ohio
Survey Area Data: Version 12, Dec 17, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 5, 2011—Mar 10, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group (MOQ-03-03)

Hydrologic Soil Group— Summary by Map Unit — Morrow County, Ohio (OH117)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
Blg1A1	Blount silt loam, ground moraine, 0 to 2 percent slopes	D	5.7	13.6%
Blg1B1	Blount silt loam, ground moraine, 2 to 4 percent slopes	D	4.9	11.5%
Gwd1B1	Glynwood silt loam, 2 to 6 percent slopes	D	3.4	7.9%
Pm	Pewamo silty clay loam	C/D	28.3	67.0%
Totals for Area of Interest			**42.2**	**100.0%**

Rating Options—Hydrologic Soil Group (MOQ-03-03)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

ED_014244A_00000159-00074


167
2
155
N
MOQ-03-04
165
169
Westfield-Fulton Rd
159
166
Kilbourne-Carrington Rd
Pompey Rd
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Form BUA-4 Page 1 of 2

Beneficial Use Site Information

Ohio EPA Site I.D. (Ohio EPA Use Only)

Field site I.D.: **MOQ-03-04**	
Beneficial use site location: **North of Westfield Fulton Rd East of Pompey Rd**	
County: **Morrow**	Township: **Fulton**
Latitude: **40°26'28.16"N**	Longitude: **82°53'13.36"W**

Total acreage proposed for beneficial use: **224.5 acres**	
Soil pH (s.u.): **6.1**	Soil phosphorus (mg/kg): **25.0** Bray Kurtz P1 ■ Mehlich 3 ☐
Bedrock depth (feet): **>3'**	

Type of crops to be grown:

Crop Type	Expected Yield
Corn	**185 bu**
Soybeans	**60 bu**
Wheat	
Pasture	
Hay	
Other:	

Soil Types:

Soil Unit Symbol	Soil Unit Name	Hydrologic Soil Group
Blg1A1	**Blount silt loam, ground moraine, 0 to 2 % slopes**	**D**
Blg1B1	**Blount silt loam, ground moraine, 2 to 6 % slopes**	**D**
Gwd1B1	**Glynwood silt loam, 2 to 6 % slopes**	**D**
Pm	**Pewamo silty clay loam**	**C/D**

Are any endangered species or endangered species habitats located on the beneficial use site?

☐ Yes	■ No

If "Yes" is marked, list the types of endangered species or endangered species habitat:

Have biosolids been beneficially used on the site since July 20, 1993?

☐ Yes	■ No

If "Yes" is marked, list the biosolids generators and years beneficial use occurred:

Generator	Year of Beneficial Use

The application must also include all of the following.

- ■ A soil map of the proposed beneficial use site.
- ■ An aerial map of the proposed beneficial use site that clearly identifies the entrance of the beneficial use site from the nearest road and all applicable isolation distances as established in Chapter 3745-40 of the Ohio Administrative Code.
- ■ A vicinity road map at or near the township level that clearly identifies the proposed beneficial use site with all roads labeled.
- ■ A copy of the most recent soil test results identified in this form.

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MOQ-03-04

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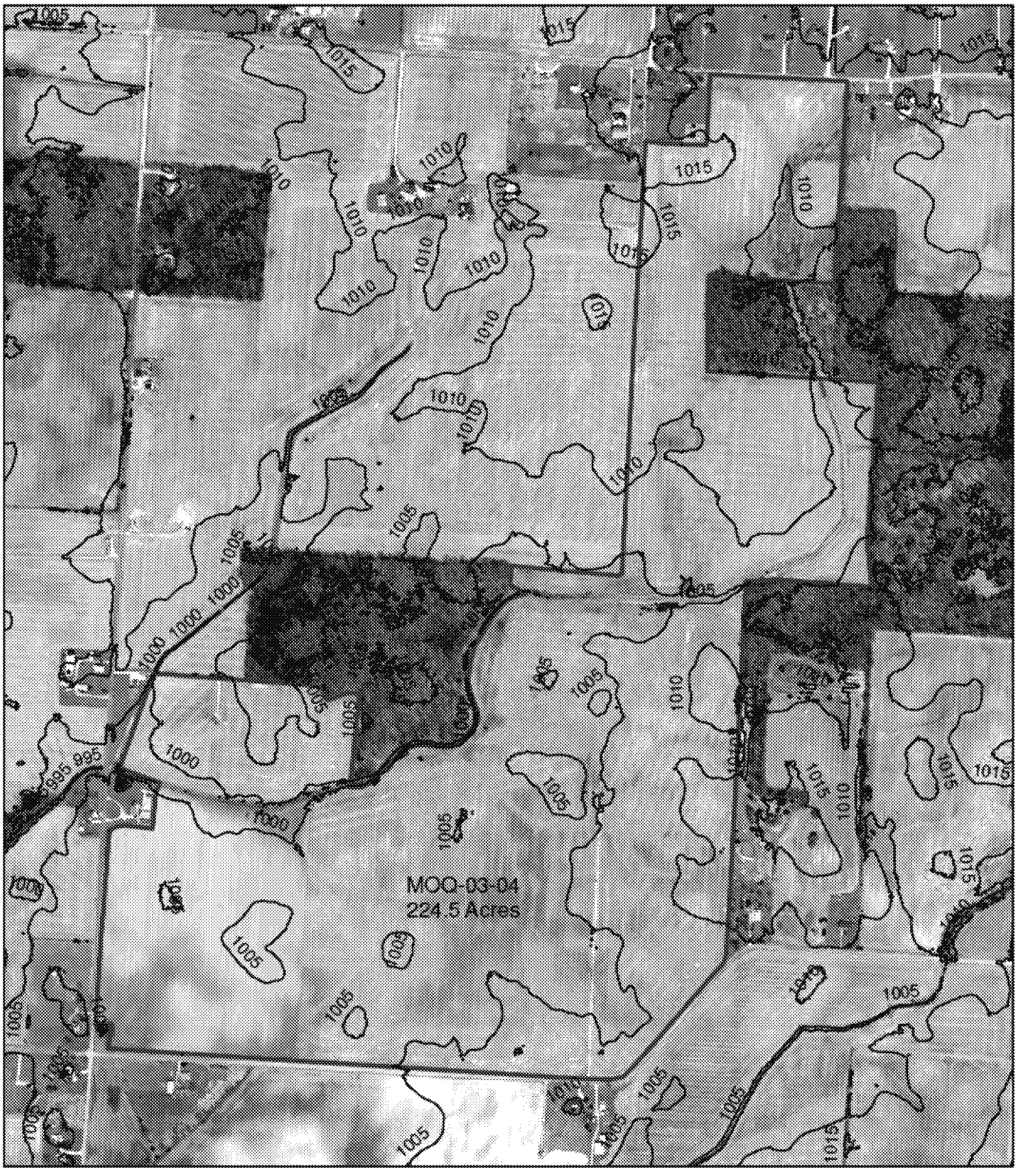
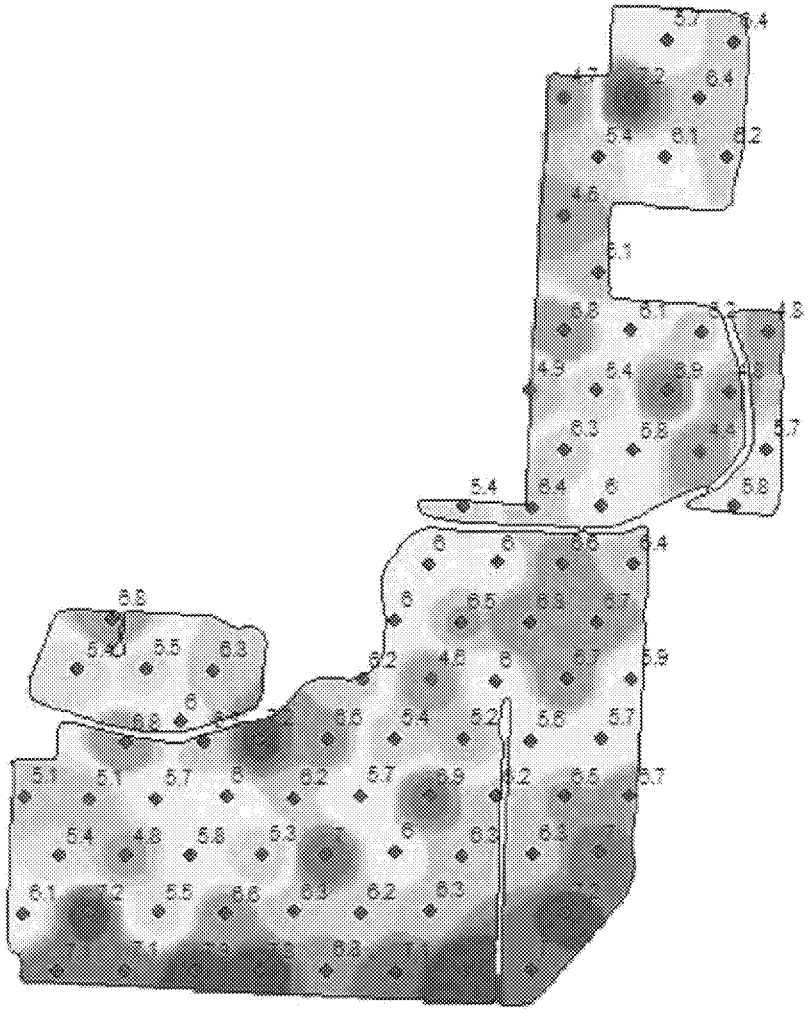
MOQ-03-04



Coles -
Soil Test pH (Water, 1:1)



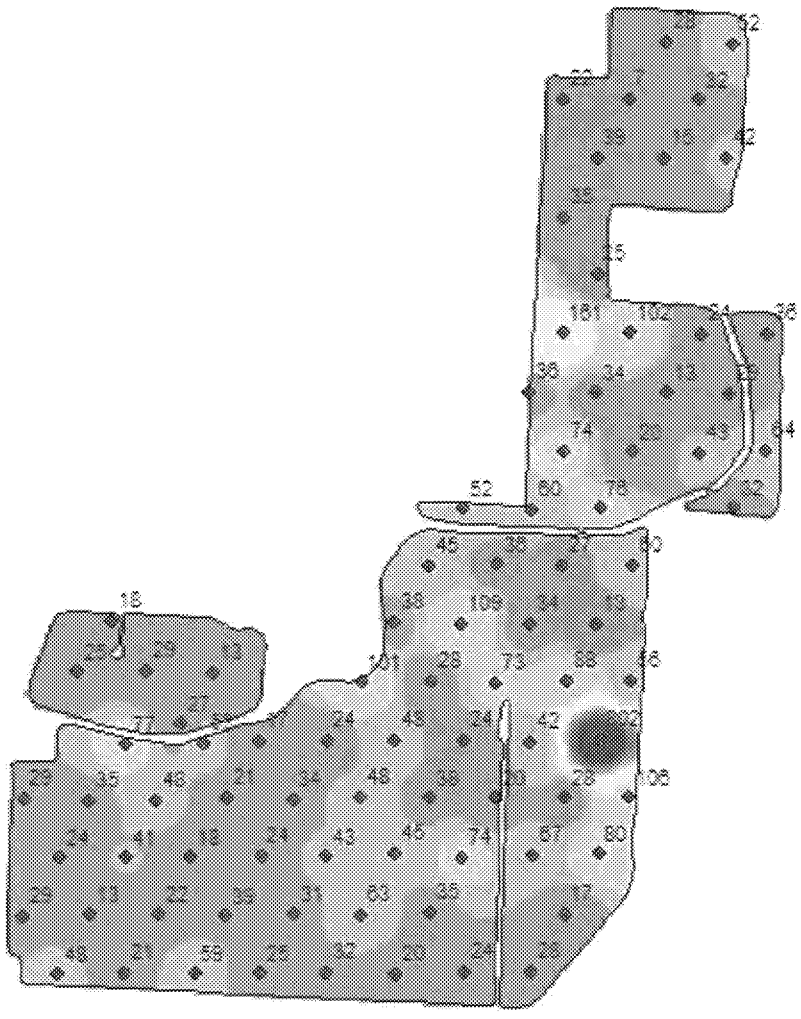
Customer: Etgen Farms
Phone: 740-747-2897
Address: 1673 Co Rd 159
Ashley, Ohio 43003
Boundary Area: 218.07 (ac)
Min: 4.4 (pH)
Avg: 6.1 (pH)
Max: 7.5 (pH)
Std. Dev: 0.7 (pH)
Sample Depth: 0 (in) - 6 (in)
Start Date: 11/9/2011 3:15:00 PM
End Date: 11/9/2011 3:16:00 PM

pH	ac	%
4.4 - 4.9	11.92	5.32
4.9 - 5.3	14.27	6.37
5.3 - 5.6	21.29	9.49
5.6 - 5.9	28.54	12.74
5.9 - 6.2	35.96	16.04
6.2 - 6.5	48.83	21.79
6.5 - 6.8	32.21	14.37
6.8 - 7.1	20.31	9.06
7.1 - 7.5	10.82	4.83
pH Water 1:1		
Field Boundary		

OHIGRO Inc. Ohigro Inc.-Waldo
740-726-2429

Coles -

Soil Test Phosphorus (Bray P-1, 1:1)



0 565 1130 1694 2259 ft

Customer:	Etgen Farms
Phone:	740-747-2897
Address:	1673 Co Rd 159 Ashley, Ohio 43003
Boundary Area:	218.07 (ac)
Min:	7 (lb/ac)
Avg:	50 (lb/ac)
Max:	802 (lb/ac)
Std. Dev:	75 (lb/ac)
Sample Depth:	0 (in) - 6 (in)
Start Date:	11/9/2011 3:15:00 PM
End Date:	11/9/2011 3:16:00 PM

lb/ac	ac	%
7 - 39	136.27	60.80
39 - 67	58.15	25.95
67 - 114	22.64	10.10
114 - 210	3.50	1.56
210 - 341	0.68	0.30
341 - 480	0.51	0.23
480 - 611	0.59	0.26
611 - 726	0.67	0.30
726 - 802	1.12	0.50
P Bray1		
Field Boundary		

OHIGRO Inc. Ohigro Inc.-Waldo
740-726-2429

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Morrow County, Ohio

March 4, 2014

Custom Soil Resource Report
Soil Map

Map Scale: 1:9,840 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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Map Unit Legend

Morrow County, Ohio (OH117)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
Blg1A1	Blount silt loam, ground moraine, 0 to 2 percent slopes	79.1	35.2%
Blg1B1	Blount silt loam, ground moraine, 2 to 4 percent slopes	37.0	16.5%
Gwd1B1	Glynwood silt loam, 2 to 6 percent slopes	2.1	1.0%
Pm	Pewamo silty clay loam	106.0	47.3%
Totals for Area of Interest		**224.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that

Morrow County, Ohio

Blg1A1—Blount silt loam, ground moraine, 0 to 2 percent slopes

Map Unit Setting

Elevation: 700 to 1,300 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 140 to 180 days

Map Unit Composition

Blount, ground moraine, and similar soils: 85 percent
Minor components: 15 percent

Description of Blount, Ground Moraine

Setting

Landform: Ground moraines on till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 31 to 54 inches to densic material
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 6.2 inches)

Interpretive groups

Farmland classification: Prime farmland if drained
Land capability (nonirrigated): 2w
Hydrologic Soil Group: D

Typical profile

0 to 10 inches: Silt loam
10 to 33 inches: Silty clay
33 to 39 inches: Clay loam
39 to 79 inches: Clay loam

Minor Components

Pewamo, ground moraine

Percent of map unit: 9 percent
Landform: Ground moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear

Across-slope shape: Linear, concave

Glynwood, ground moraine

Percent of map unit: 6 percent
Landform: Ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Linear

BlgB1—Blount silt loam, ground moraine, 2 to 4 percent slopes

Map Unit Setting

Elevation: 700 to 1,300 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 140 to 180 days

Map Unit Composition

Blount, ground moraine, and similar soils: 85 percent
Minor components: 15 percent

Description of Blount, Ground Moraine

Setting

Landform: Ground moraines on till plains
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Wisconsin till derived from limestone and shale

Properties and qualities

Slope: 2 to 4 percent
Depth to restrictive feature: 30 to 54 inches to densic material
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Low (about 5.6 inches)

Interpretive groups

Farmland classification: Prime farmland if drained
Land capability (nonirrigated): 2e
Hydrologic Soil Group: D

Typical profile

0 to 9 inches: Silt loam
9 to 32 inches: Silty clay
32 to 37 inches: Clay loam
37 to 79 inches: Clay loam

Minor Components

Pewamo, ground moraine

Percent of map unit: 9 percent
Landform: Ground moraines on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave

Glynwood, ground moraine

Percent of map unit: 6 percent
Landform: Ground moraines on till plains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear

Gwd1B1—Glynwood silt loam, 2 to 6 percent slopes

Map Unit Setting

Elevation: 750 to 1,300 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 140 to 180 days

Map Unit Composition

Glynwood and similar soils: 85 percent
Minor components: 15 percent

Description of Glynwood

Setting

Landform: Ground moraines
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey till

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 30 to 42 inches to densic material
Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water capacity: Low (about 5.5 inches)

Interpretive groups
Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 2e
Hydrologic Soil Group: D
Other vegetative classification: Trees/Timber (Woody Vegetation)

Typical profile
0 to 9 inches: Silt loam
9 to 29 inches: Clay
29 to 36 inches: Clay loam
36 to 80 inches: Clay loam

Minor Components

Blount
Percent of map unit: 8 percent
Landform: Flats on ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)

Pewamo
Percent of map unit: 7 percent
Landform: Depressions on till plains
Landform position (two-dimensional): Toeslope
Down-slope shape: Concave
Across-slope shape: Linear
Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)

Pm—Pewamo silty clay loam

Map Unit Setting
Elevation: 600 to 1,400 feet
Mean annual precipitation: 29 to 42 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 180 days

Map Unit Composition
Pewamo and similar soils: 85 percent
Minor components: 15 percent

Description of Pewamo

Setting

Landform: Drainageways, depressions
Parent material: Till

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Available water capacity: High (about 10.2 inches)

Interpretive groups

Farmland classification: Prime farmland if drained
Land capability (nonirrigated): 2w
Hydrologic Soil Group: C/D

Typical profile

0 to 15 inches: Silty clay loam
15 to 66 inches: Silty clay loam
66 to 80 inches: Clay loam

Minor Components

Blount

Percent of map unit: 3 percent
Landform: Flats on end moraines, rises on ground moraines, rises on end moraines, flats on ground moraines
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Linear
Across-slope shape: Linear

Sloan

Percent of map unit: 3 percent
Landform: Flood plains

Condit

Percent of map unit: 3 percent
Landform: Depressions on ground moraines
Down-slope shape: Concave
Across-slope shape: Concave

Carlisle

Percent of map unit: 3 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave

Bennington

Percent of map unit: 3 percent
Landform: Rises on end moraines, rises on ground moraines, flats on ground moraines, flats on end moraines

Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Linear
Across-slope shape: Linear

Thinner or lighter colored surface layer
Percent of map unit:
Landform: Depressions, drainageways

More sand and less clay in the subsoil
Percent of map unit:
Landform: Drainageways, depressions

Slopes of 3 or 4 percent
Percent of map unit:
Landform: Drainageways, depressions

Custom Soil Resource Report
Map—Depth to Any Soil Restrictive Layer (MOQ-03-04)

Map Scale: 1:9,840 if printed on A portrait (8.5" x 11") sheet.

Meters: 0 100 200 400 600

Feet: 0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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Date(s) aerial images were photographed: Oct 5, 2011—Mar 10, 2012

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Table—Depth to Any Soil Restrictive Layer (MOQ-03-04)

Depth to Any Soil Restrictive Layer— Summary by Map Unit — Morrow County, Ohio (OH117)				
Map unit symbol	**Map unit name**	**Rating (centimeters)**	**Acres in AOI**	**Percent of AOI**
Blg1A1	Blount silt loam, ground moraine, 0 to 2 percent slopes	99	79.1	35.2%
Blg1B1	Blount silt loam, ground moraine, 2 to 4 percent slopes	94	37.0	16.5%
Gwd1B1	Glynwood silt loam, 2 to 6 percent slopes	91	2.1	1.0%
Pm	Pewamo silty clay loam	>200	106.0	47.3%
Totals for Area of Interest			**224.3**	**100.0%**

Rating Options—Depth to Any Soil Restrictive Layer (MOQ-03-04)

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Hydrologic Soil Group (MOQ-03-04)

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils

Custom Soil Resource Report
Map—Hydrologic Soil Group (MOQ-03-04)

Map Scale: 1:9,840 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

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- Aerial Photography

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Table—Hydrologic Soil Group (MOQ-03-04)

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Blg1A1	Blount silt loam, ground moraine, 0 to 2 percent slopes	D	79.1	35.2%
Blg1B1	Blount silt loam, ground moraine, 2 to 4 percent slopes	D	37.0	16.5%
Gwd1B1	Glynwood silt loam, 2 to 6 percent slopes	D	2.1	1.0%
Pm	Pewamo silty clay loam	C/D	106.0	47.3%
Totals for Area of Interest			**224.3**	**100.0%**

Rating Options—Hydrologic Soil Group (MOQ-03-04)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher